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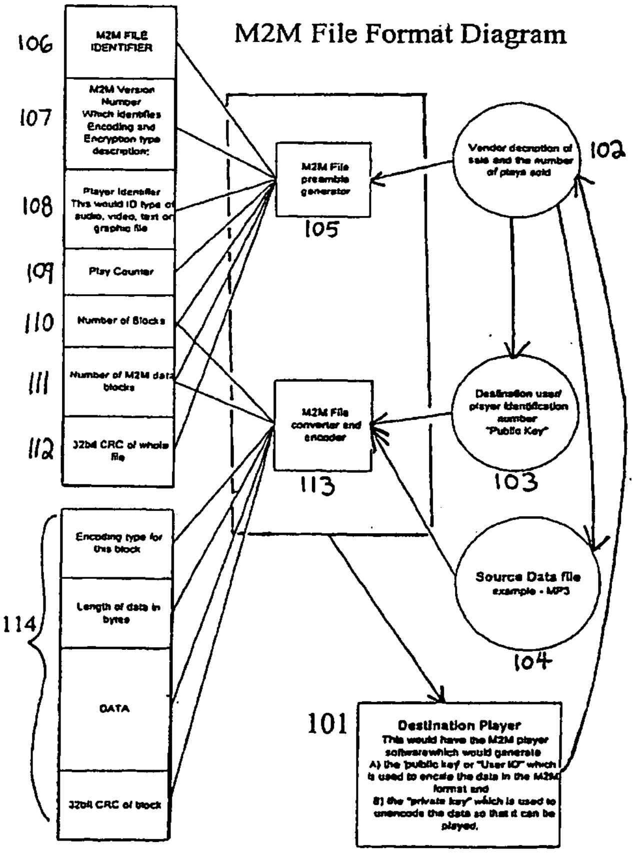
(54) Title: COPY-PROTECTION SYSTEM AND METHOD


M2M File Format Diagram
106
M2M FILE IDENTIFIER
107
M2M Version Number Which identifies Encoding and Encryption type description:
108
Player Identifier This would ID type of audio, video, text or graphic file
109
Play Counter
110
Number of Blocks
111
Number of M2M data blocks
112
32bit CRC of whole file
114
Encoding type for this block
Length of data in bytes
DATA
32bit CRC of block
M2M File preamble generator
105
M2M File converter and encoder
113
Vendor decnption of sale and the number of plays sold
102
Destination user/ player identification number "Public Key"
103
Source Data file example - MP3
104
101
Destination Player
This would have the M2M player softwarewhich would generate
A) the 'public key' or "User ID" which is used to encde the data in the M2M format and
B) the "private key" which is used to unencode the data so that it can be played.

(57) Abstract: The present invention provides copyright protection to media services operating across the Intranet. Copyright protection customers are first registered with the media services' copyrighted data provider, and then provided access to the media services' database, including music and audiovisual material, via the Internet to a single playing device with a unique identifier. Preferably, access is provided via a scrambled digital file containing the unique identifier and data blocks from the database. By using the invented format and systems, secure access and secure downloading of copyrighted contents are done while maintaining copyright protection.

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COPY-PROTECTION SYSTEM AND METHOD

DESCRIPTION

BACKGROUND OF THE INVENTION

Field of the Invention.

Embodiments of the present invention relate to digitally encoded copyrighted data of any kind. As an introduction to the problems solved by the present invention, consider the development of present-day MP3.WAV type players. MP3 technology allows users to download audio and music content over the Internet for play on MP3 compatible playing devices, including those that are portable and those internal to a personal computer. From the point of view of the audio and music content recording industry, a major drawback to the presently available MP3 devices and technologies is that they afford virtually no protection against copyright infringements by either Internet MP3.WAV sourcing parties, nor by MP3 end users. The present invention remedies this functional deficiency by a novel and innovative process for controlling access to media content through a copy-protection format that allows the copyrighted information to be played or displayed only on a targeted media player device and only for a predetermined number of plays. This system would protect ***any type of digitally encoded data*** that was transmitted on the Internet or via other digital transmission medium.

SUMMARY OF THE INVENTION

The present invention relates to on-line servers and databases operated by a media service providing operation across the Internet or an Intranet. These services would be available to customers who have playing devices with unique identifiers that would allow the server to identify the unique customer and cross reference them to a customer database. Then the serviced product would be put into the novel copy-protected format ("m2m format") with the unique identifier for the target device embedded in the format so that it would play only on the intended target device.

For example, customers for a music file would give the player-code number for their player to the provider of music which would convert the audio file to the m2m format which would only de-code on the target player. Transferred files are not transportable and are dedicated to the particular target device. Any attempt to copy the transferred file from one device to another would not be useful. The transferred files may only be played on the particular target device. With the m2m copy-protection format the provider of the file would be able to determine which device the file would play on and how many times it could be played.

The benefits of the novel format are made possible by the incorporation of a unique serial number for each target device. This could be a MAC code on a network card or a serial number in an E-Prom for the target device. The unique serial number must be identifiable by the vendor of copy-protected material and unique to the target media player device. Once the m2m format player software is installed on the target device, the transferred files may be displayed or displayed by the user.

Once the user is registered, the then-operational target device can be used to access the provider servers, which give access to copyrighted content libraries, on a per title basis. For marketing promotions, pre-selected portions of titles could be made available for free review (by prior arrangements with copyrighted content providers). Once titles are selected for downloading, charges are made to the customer's account. Each account is billed to the pre-arranged credit card on a monthly or other basis.

With this type of format and control of data information, providers (e.g., music companies) could justify lower fees for downloading(i.e., as little as 25 cents per title) due to the low cost of conveying the song to the customer and control of number of plays. This low cost will be seen as a valuable feature by the end user. At the same time, copyright rights are protected and the artists and recording companies can collect negotiated fees on a per title basis.

These and other embodiments, aspects, advantages, and features of the present invention will be set forth in part in the description, and in part will come to those skilled in the art by reference to the following description of the invention and referenced drawing, or by practice of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic block diagram illustrating a routine that enables access to the inter-networked system components according to one m2m embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention provides a system and method for providing copy-protected digital information from vendor databases to users in a manner that completely protects the copyright rights of the vendor. The system utilizes a globally unique identifier, which is unique to a particular playing device. The system encrypts the copy-protected digital information such that it may only be de-encrypted on said particular device with said unique identifier. The information may only be played or displayed on the particular device identified by the vendor. Furthermore, the information may only be played or displayed on the particular device a set number of times. The vendor sets the number of times the information may be played or displayed.

The idea is to rewrite and scramble digital files where all bits of information in the file are spread and shifted so that any part of this file is not readable by any means. For example, this is not true for MP3 files since they are "periodic" codes, where some pattern is again and again repeated and helps synchronize a data stream. Thus, if you cut MP3 files into short sequences, it could be played separately in these pieces. Further MP3 coding has no protection against replay and may be copied onto and played by other devices (e.g., PC, MP3-player, etc.). MP3 utilizes universal coding, which may be used for any use on any MP3 device. Notably, the novel m2m format is private and enables the song to be played only by the registered user, on the particular uniquely identified device, in specifically defined order, and for a specified number of times.

M2M format uses the following:

a) **Preamble:** which consists of the M2M file identifier, M2M version number and Player identifier;

b) **Public Key:** Users numeric name or Identification Number;

c) **Private Key:** The key that unlocks the data on the destination player. This key is held separately and is not part of the file transfer, but is on the target device;

d) **Play Counter:** which says to the player how many times this song may be played including the option of unlimited plays;

e) **Encoding and Encryption type description:** This would be an integer number which specifies method of scrambling;

f) **File size description:** Description of size of blocks and number of blocks in file and number of M2M data blocks; and

g) **M2M Data blocks:** The data block is then packed by a scrambling algorithm with a predetermined digital file signature based on the public key of the target destination player.

Sample file structure:

Structure of M2M file:

Offset [B]		Length [B]	Description
0	0x00	4	M2M file identifier: ".M2M"
4	0x04	4	Version - version of M2M
8	0x08	4	Player Identifier
12	0x0C	4	Play Counter
16	0x10	4	Number of blocks
20	0x14		M2M data blocks
-		4	32bit CRC of whole file

Structure of each M2M data block:

Offset [B]		Length [B]	Description
0	0x00	4	Encoding type for this block
4	0x04	4	Length of data in bytes (usually 1024)
4	0x08		Data
-		4	32 bit CRC of block

One embodiment of the present invention may be better understood by reference to **Fig. 1.** **Fig. 1** is a schematic diagram illustrating a routine that enables access to the inter-networked system components according to one m2m format embodiment of the invention. The customer accesses the vendor **102** via the destination media player **101.** The destination media player **101** is equipped with the m2m player software which would generate both 1) the "public key" (or "user ID") which is used to encode the data in the m2m format; and 2) the "private key" which is used to unencode the data so that it can be played or displayed. The public key is unique to each particular destination player. The public key information is transmitted to the vendor **102** from the destination player **101.** The private key information is never transferred.

The user interacts with the vendor **102** in making purchasing decisions. The user chooses the information to be accessed and the number of times said accessed information may be displayed or played. For example, the user may choose a particular MP3 file to be played on the destination player **101,** and may also choose the number of times (including an unlimited number of times) that the file is to be played.

The first time a user accesses the vendor **102** with a particular player **101,** billing information may be obtained. The unique serial number associated the particular destination player **101** may be used as a user ID for billing purposes. Future selections may be charged to the user's account according to the pre-arranged billing information.

Once the vendor **102** has identified the destination player's **101** unique public key, and the user has made all selections, the vendor **102** provides the information to the novel copy protection system **115.**

The vendor **102** provides the novel system **115** with information including: the destination player public key information **103**, the source data file **104** selected by the user, the type of file (e.g., MPEG, JPEG, MP3, DVD, etc.) chosen by the user to be transmitted to, and displayed on, the destination player **101**, the size of the chosen file, the number of plays chosen by the user (interpreted by the play counter **109**) and the version of the encoder/unencoder on the user's destination player **101** (identified by an m2m version number **107** which identifies encryption type).

The m2m file preamble generator **105** includes: the m2m file identifier **106**; the m2m version number **107** (which identifies encoding and encryption type); the player identifier **108** (which identifies the type of file requested); the play counter **109** (which determines the number of plays requested); the number of blocks **110**, the number of m2m data blocks **111**, and the 32 bit CRC of the entire file **112**.

The m2m file converter and encoder **113** uses the public key information **103** provided by the vendor **102** to convert the source data file **104** into the novel encrypted format.

Each m2m data block **114** contains an encrypted portion of the source data file **104**. The data file is rewritten and scrambled such that all bits of information are spread and shifted rendering any part of the converted file unreadable. Only after the entire file is transferred from the novel system **113** to the destination player **101** may the data be unencrypted and decoded via the private key on the destination player **101**. Only the specific destination player **101** with the particular public key, which was provided to the vendor **102**, may unencrypt the file. No other device is so enabled. While the file may be downloaded onto other devices (e.g., the user's PC), it may only be unencrypted and played or displayed on the particular destination player **101** containing the public key provided to the vendor **102**.

Although this invention has been described above with reference to particular means, materials and embodiments, it is to be understood that the invention is not limited to these disclosed particulars, but extends instead to all equivalents within the scope of the following claims.

CLAIMS

I claim:

1. A system for copy-protected transmission of digitally-encoded data across the Internet, comprising:

an on-line server and database operated by a media service;

an Internet playing device with a unique identifier operated by a customer, said playing device being operatively coupled to said server and database as a result of permission granted by said media service due to recognition of said unique identifier; and

a scrambled digital file containing the unique identifier and data blocks from said database.

2. The system of Claim 1, wherein the database contains music material.

3. The system of Claim 1, wherein the database contains audio-visual material.

4. The system of Claim 1, wherein the scrambled digital file has a public key which is the unique identifier.

5. The system of Claim 1, wherein the playing device has a private key which is not part of the scrambled digital file.

6. The system of Claim 1, wherein the scrambled digital file has information that limits the number of times the file may be played by the playing device.

7. A system for copy-protected transmission of digitally-encoded data across an intranet, comprising:

an on-line server and database operated by a media service;

an intranet playing device with a unique identifier operated by a customer, said playing device being operatively coupled to said server and database as a result of permission granted by said media service due to recognition of said unique identifier; and a scrambled digital file containing the unique identifier and data blocks from said database.

8. The system of Claim 7, wherein the database contains music material.

9. The system of Claim 7, wherein the database contains audio-visual material.

10. The system of Claim 7, wherein the scrambled digital file has a public key which is the unique identifier.

11. The system of Claim 7, wherein the playing device has a private key which is not part of the scrambled digital file.

12. A method for providing copyright-protected information across the Internet or an intranet, the method comprising:

providing an on-line server and database containing copyrighted information;

operatively coupling said server and database with a playing device containing a unique identifier upon recognition of said identifier by said server and database; and

transmitting a scrambled digital file containing said unique identifier and copyrighted information to said playing device.

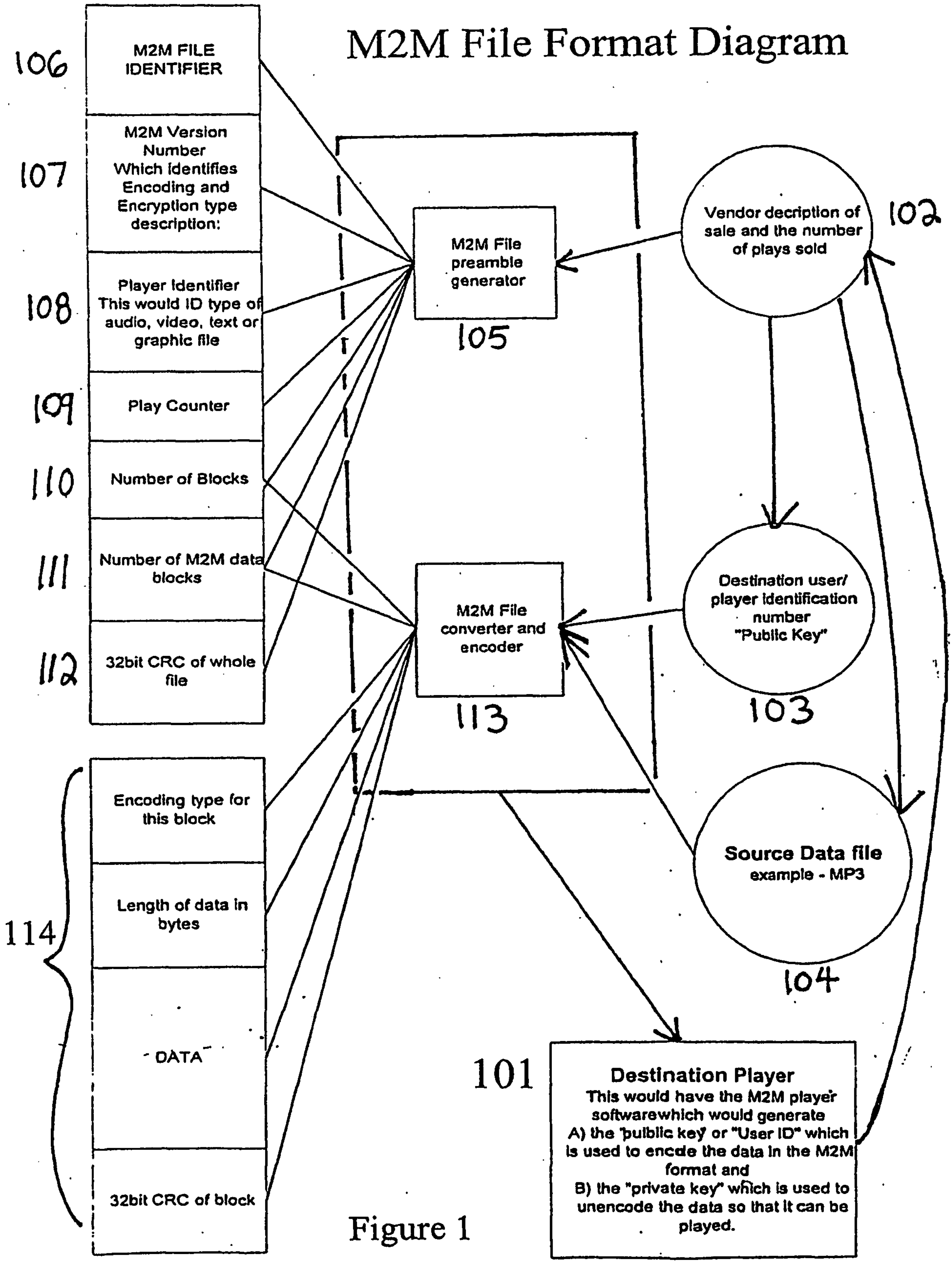
M2M File Format Diagram
106
M2M FILE IDENTIFIER
107
M2M Version Number Which identifies Encoding and Encryption type description:
108
Player Identifier This would ID type of audio, video, text or graphic file
109
Play Counter
110
Number of Blocks
111
Number of M2M data blocks
112
32bit CRC of whole file
114
Encoding type for this block
Length of data in bytes
DATA
32bit CRC of block
M2M File preamble generator
105
M2M File converter and encoder
113
Vendor decription of sale and the number of plays sold
102
Destination user/ player identification number "Public Key"
103
Source Data file example - MP3
104
101
Destination Player
This would have the M2M player softwarewhich would generate
A) the "pulblic key" or "User ID" which is used to encde the data in the M2M format and
B) the "private key" which is used to unencode the data so that it can be played.

Figure 1